

Recent field data and algorithm reviews by the OBPG: a hodgepodge of analyses

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Ocean Color Bio-optical Algorithm Mini-workshop
27-29 September 2005, University of New Hampshire

Goals

develop a strong understanding of:

the field data

Cloud cover

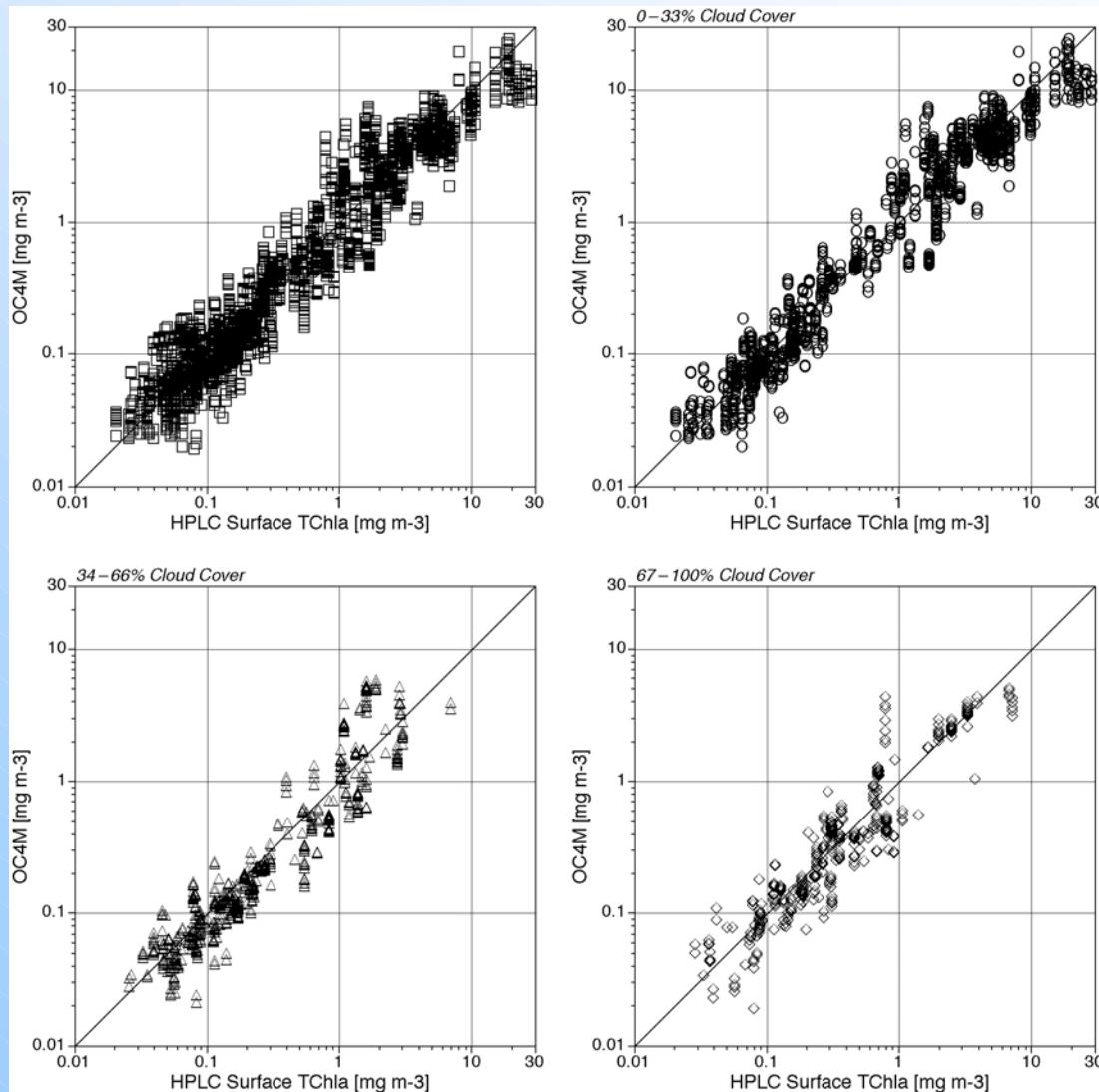
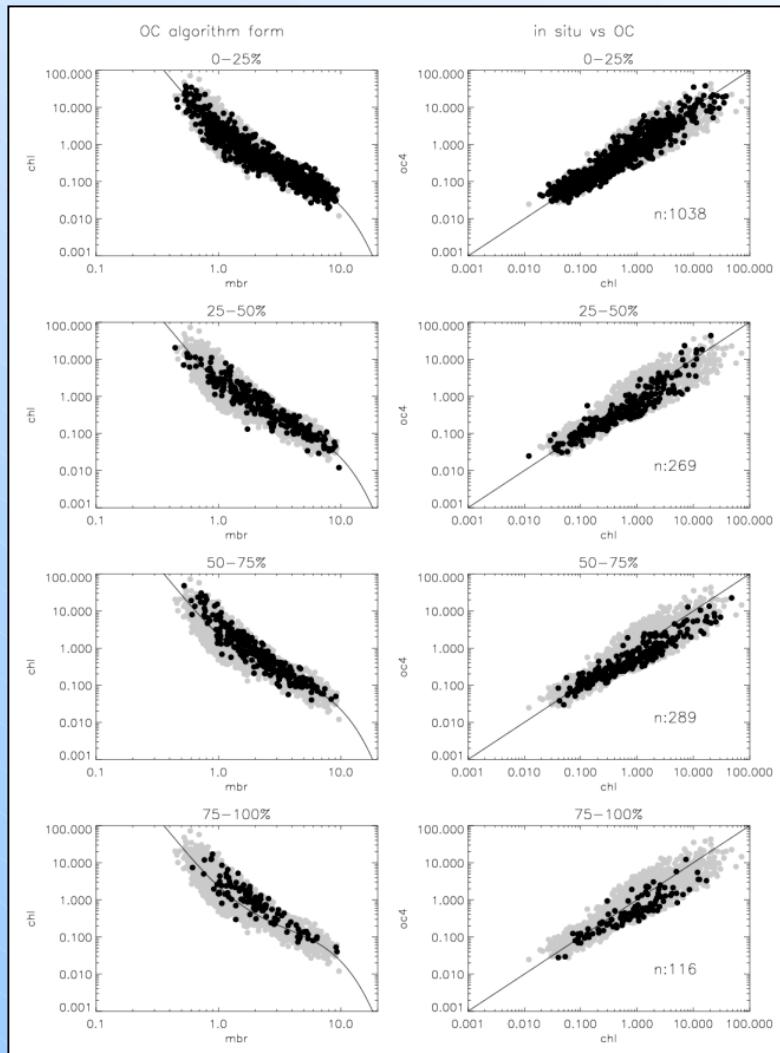
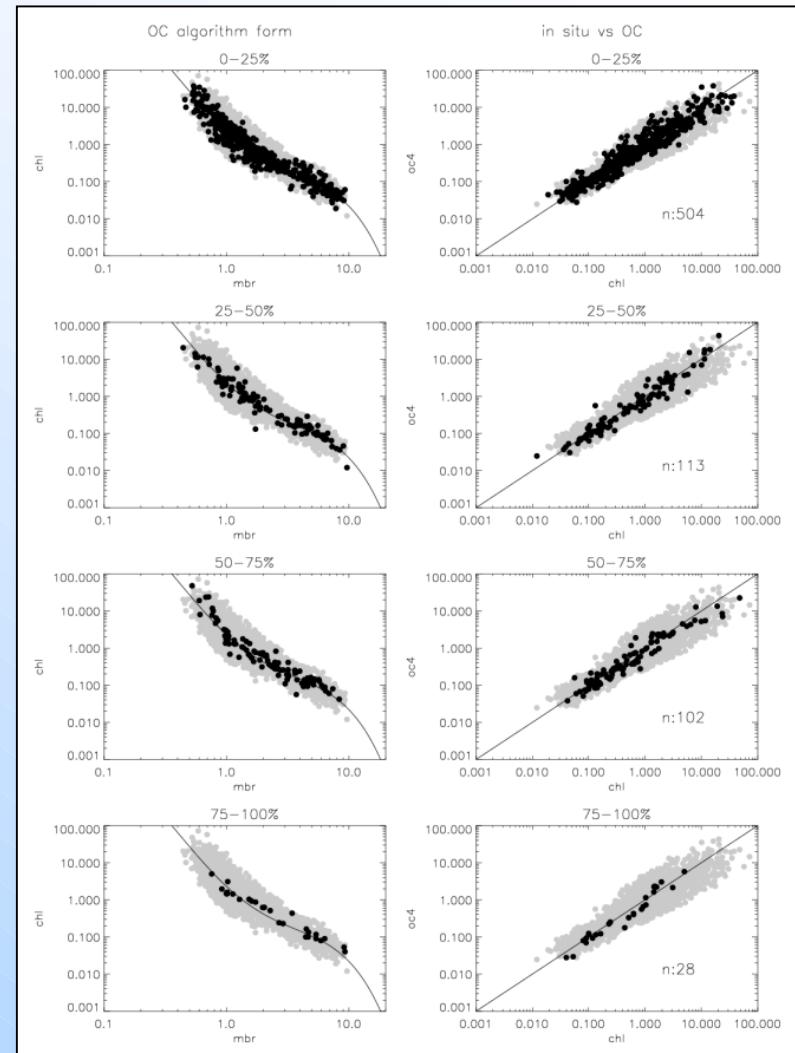


figure courtesy of
S.B. Hooker (NASA)

Cloud cover

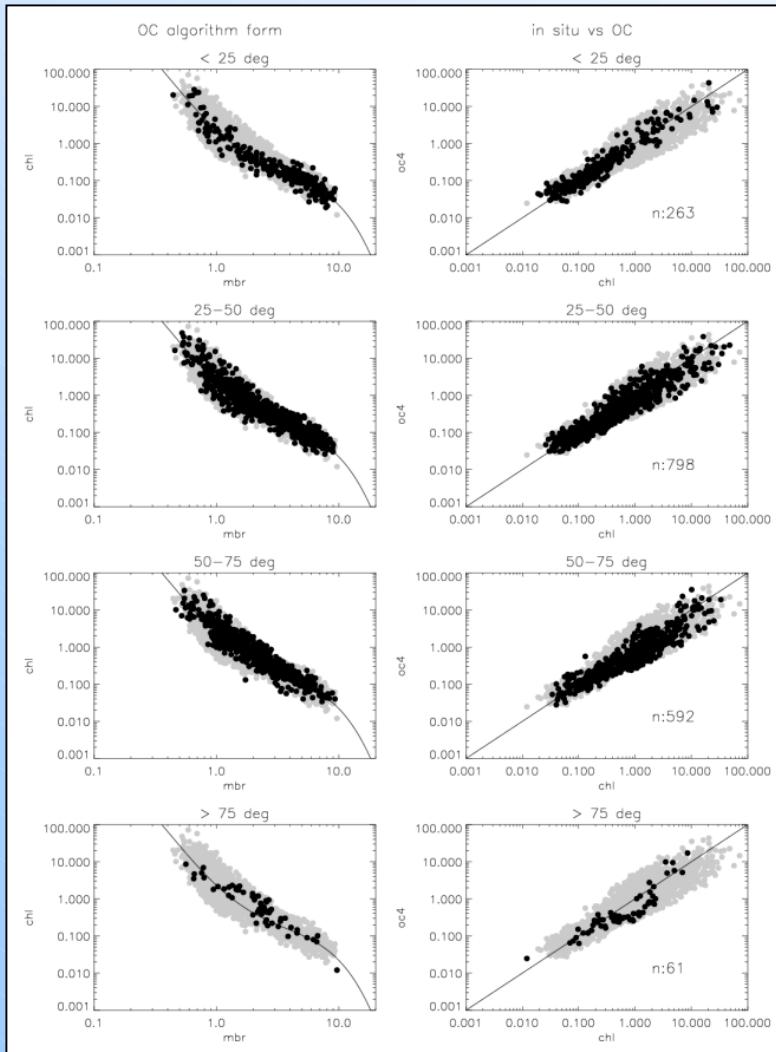


all profiles in NOMAD

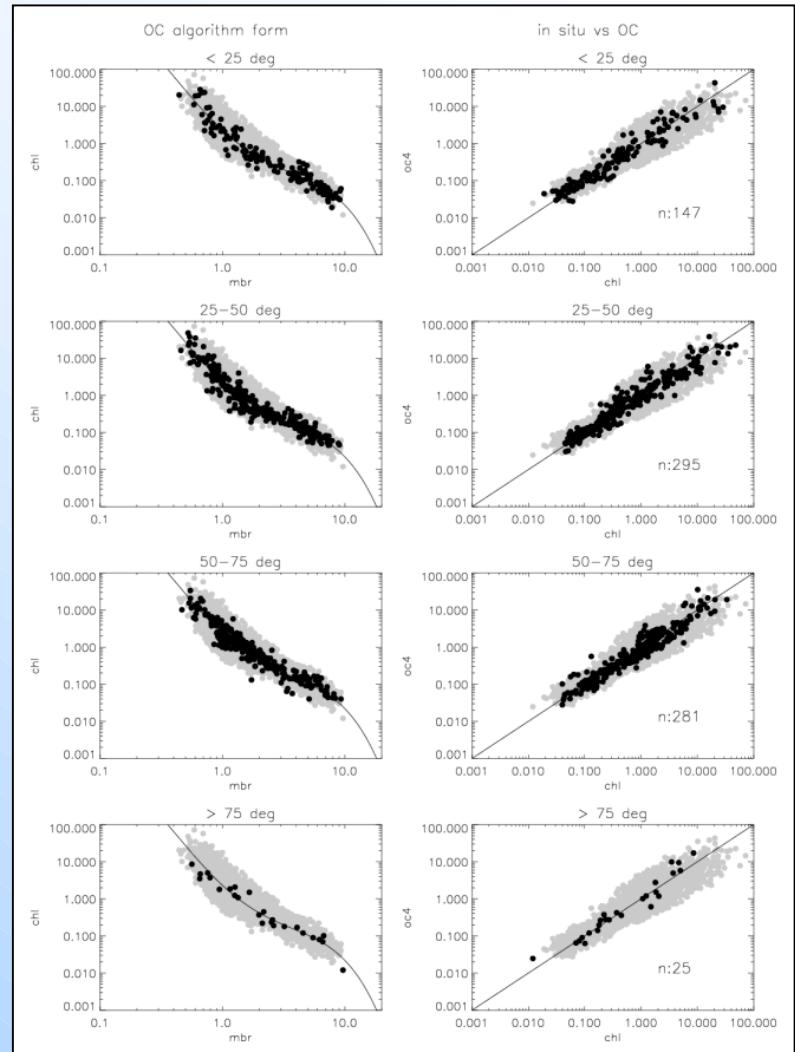


profiles processed by the OBPG

Solar zenith angle



all profiles in NOMAD



profiles processed by the OBPG

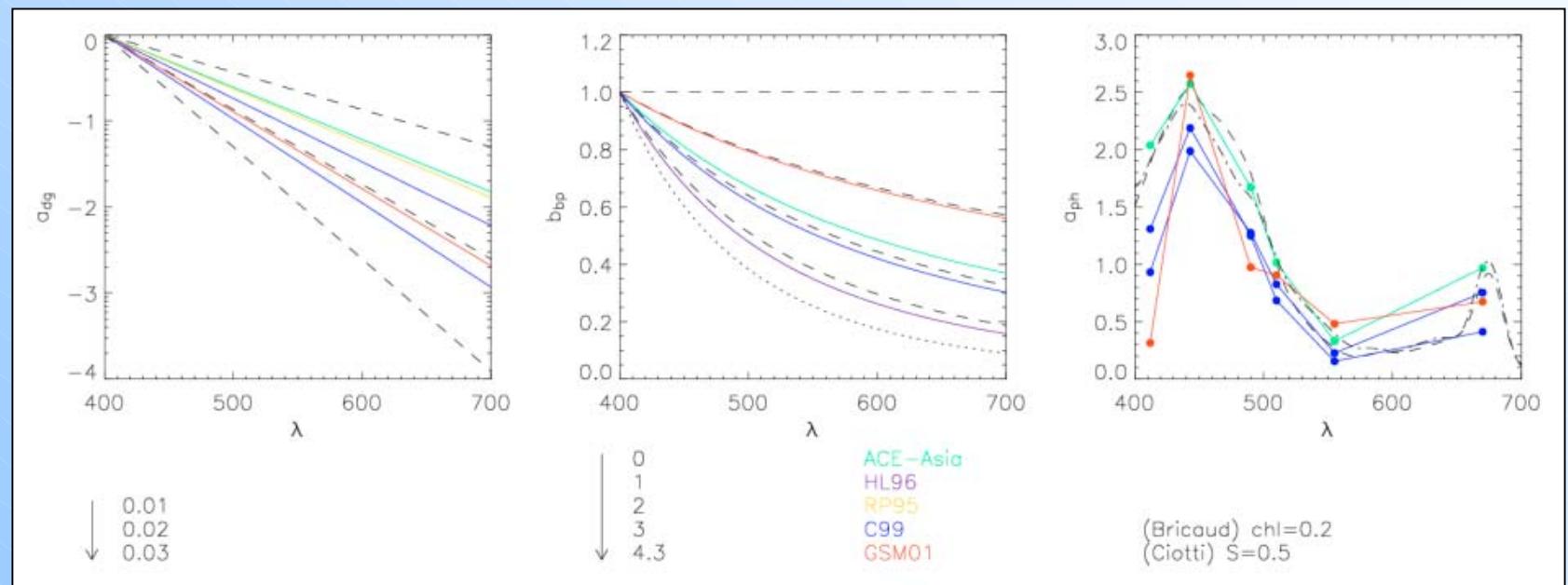
Goals

develop a strong understanding of:
the algorithms

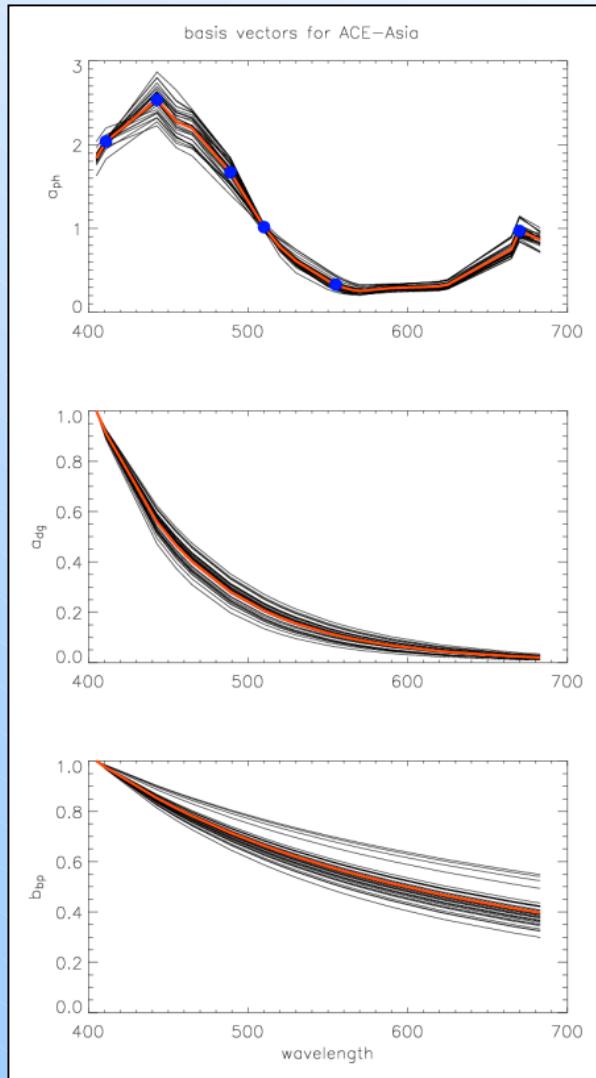
Sensitivity analyses

<i>parameter</i>	<i>magnitude</i>	<i>basis vector</i>	<i>input</i>
a_{dg}	M_{dg}	$\exp[-S(\lambda - 400)]$	S
a_ϕ	M_ϕ	\hat{a}_ϕ	\hat{a}_ϕ
b_{bp}	M_{bp}	$\lambda^{v_{bp}}$	v_{bp}

inversion method: e.g., matrix, nonlinear minimization, linear solution



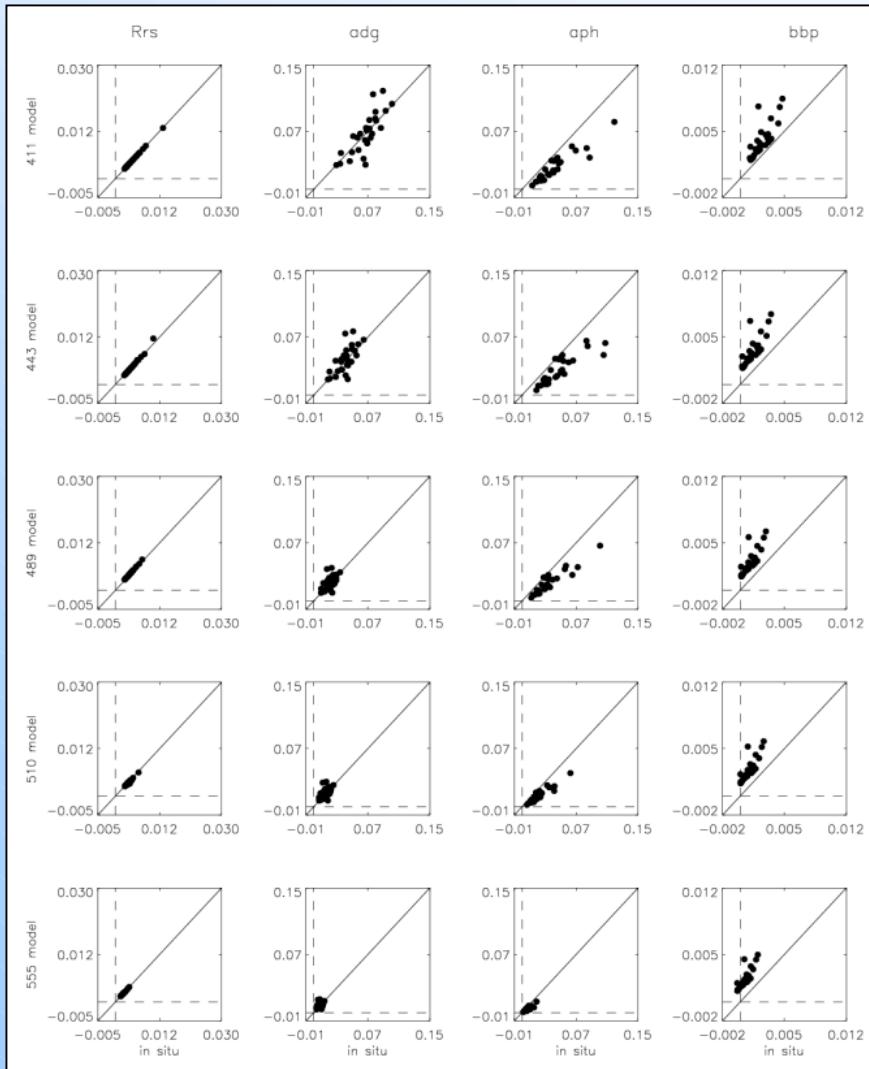
Sensitivity analyses



examine the sensitivity of
the inversion to its 3 inputs
and the inversion method

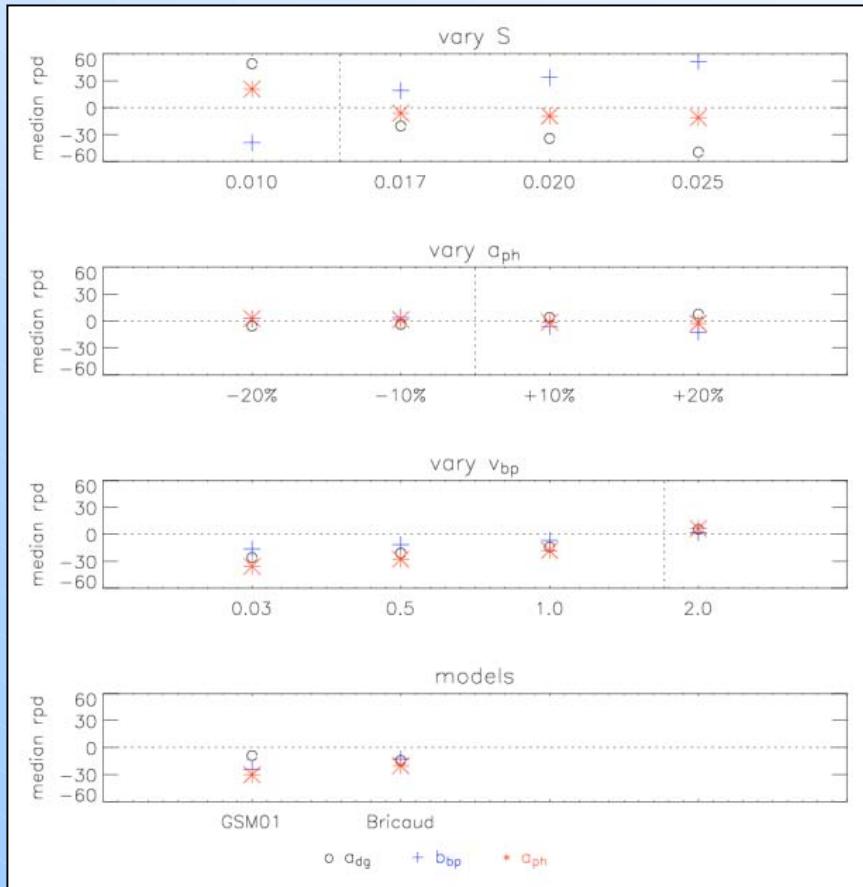
use data collected as part of
ACE-Asia (G. Mitchell, SIO)
as a case study

Sensitivity analyses



36 coincident
observations of
 R_{rs} , a_{dg} , a_{ϕ} , & b_{bp}
matrix inversion
selected for this
analysis

Sensitivity analyses



vary 1 input at a time

S : 0.014, 0.01, 0.017, 0.02, 0.025
 \hat{a}_ϕ (443-nm): -20, -10, +10, +20%
 v : 1.78, 0.03, 0.5, 1.0, 2.0

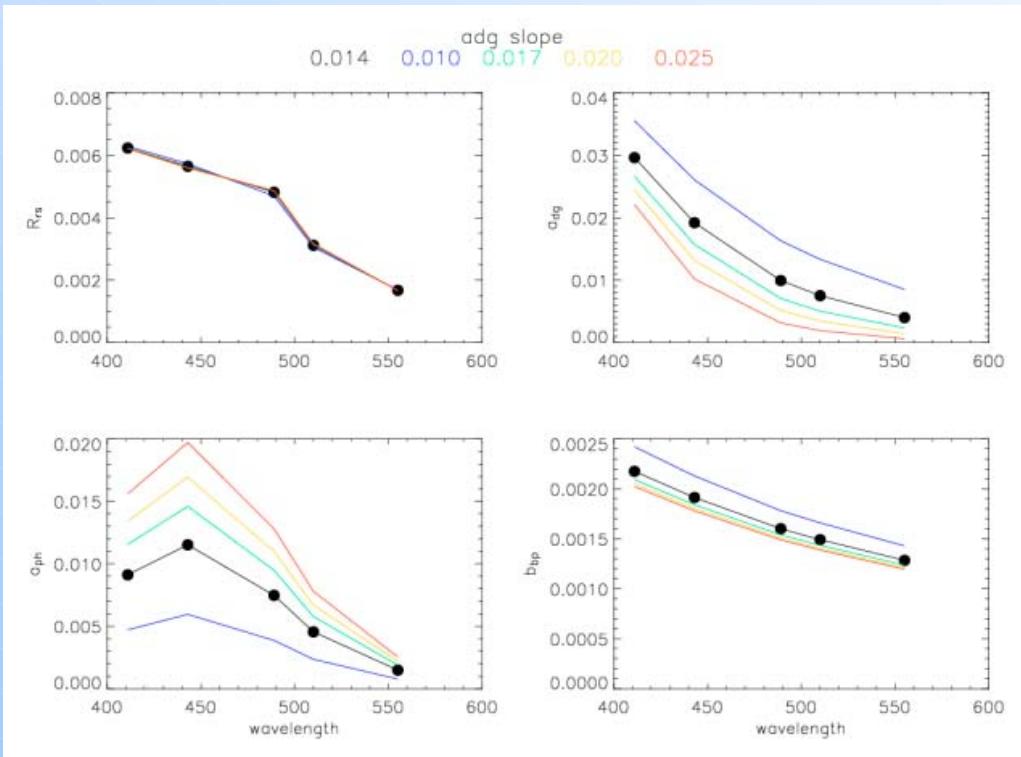
GSM01

$S = 0.0206$, $v = 1.0338$, opt. \hat{a}_ϕ

Bricaud

$S = 0.015$, $v = 1.0$, \hat{a}_ϕ (chl=0.2)

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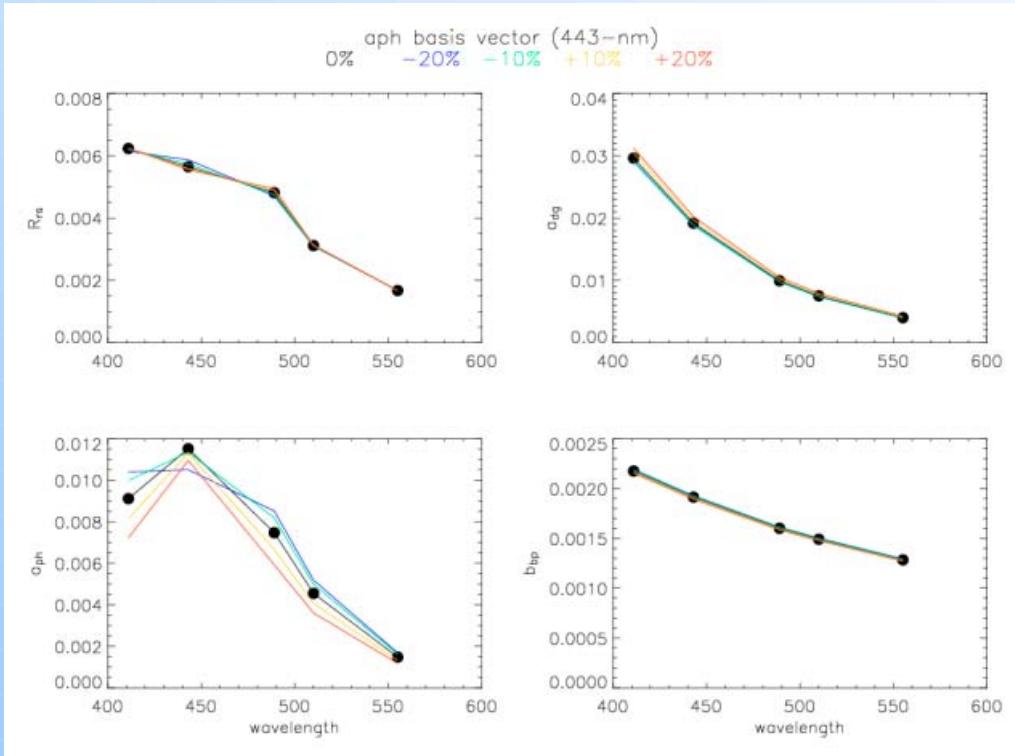
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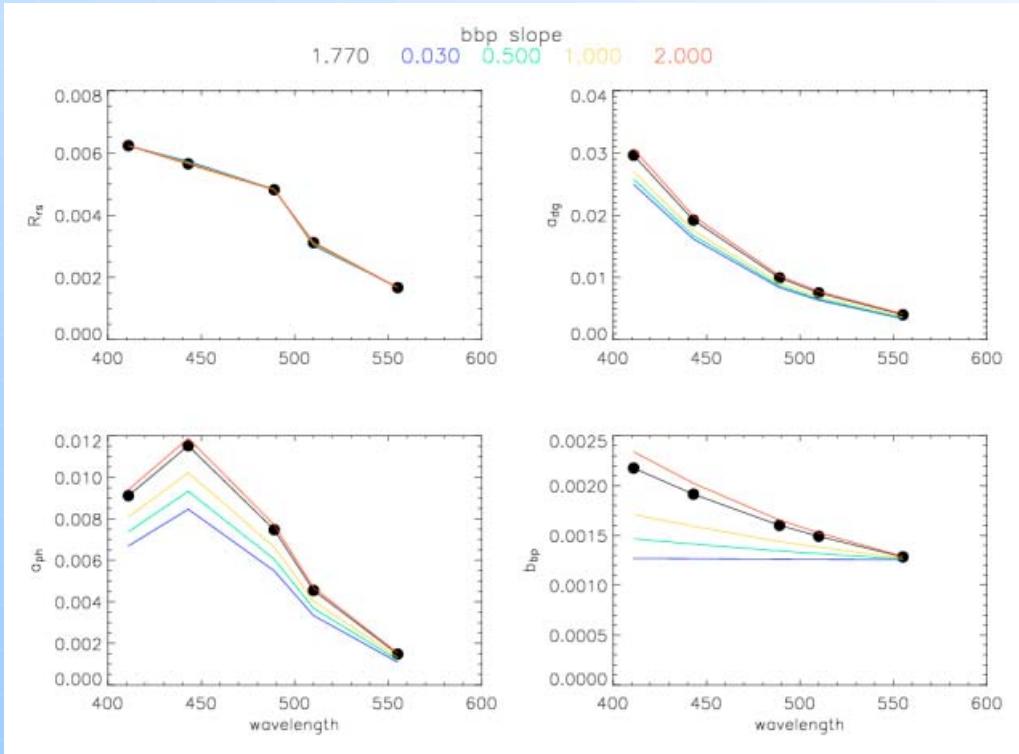
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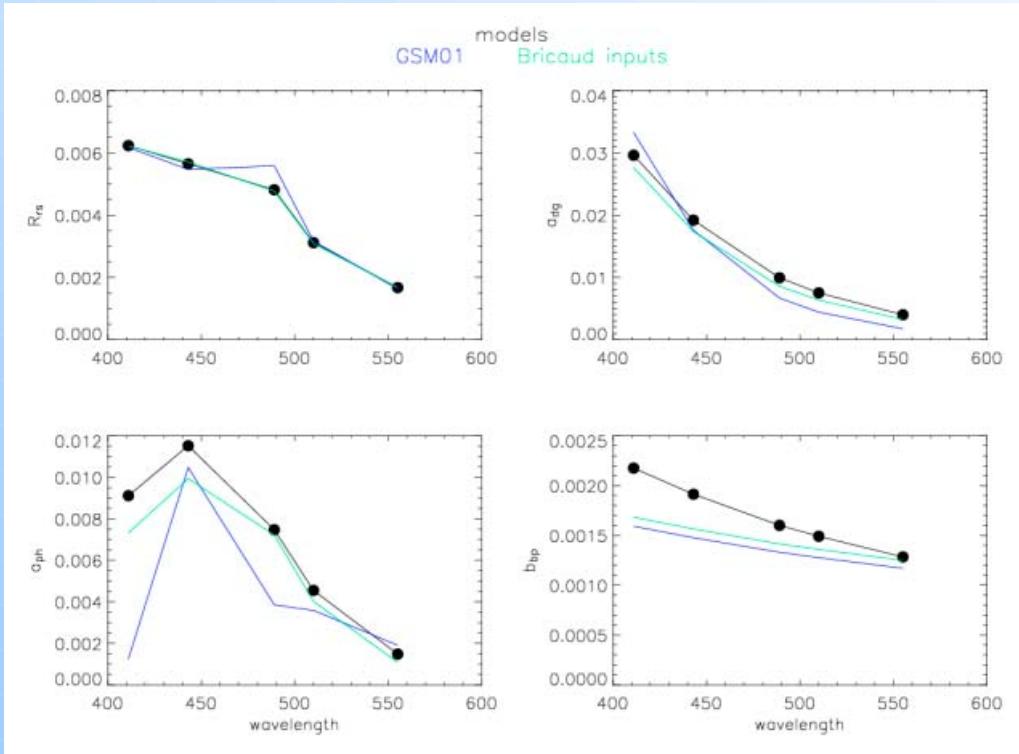
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EXTRA SLIDES

Sensitivity analyses

median relative percent differences:

Vary adg spectral slope (S) :

	0.010 (-28%)	0.017 (+21%)	0.020 (+43%)	0.025 (+76%)
adg	49.0	-20.4	-34.2	-49.5
aph	-39.1	19.2	33.6	51.4
bbp	20.8	-6.2	-9.2	-11.1

Vary bbp spectral slope (v) :

	0.03 (-98%)	0.50 (-72%)	1.00 (-44%)	2.00 (+13%)
adg	-26.0	-21.0	-14.3	5.4
aph	-16.4	-11.6	-6.9	1.8
bbp	-35.8	-27.9	-18.2	6.34

Vary aph basis vector at 443-nm:

	-20% -----	-10% -----	+10% -----	+20% -----
adg	-5.6	-3.7	3.9	7.6
aph	2.5	4.0	-6.0	-12.3
bbp	2.6	1.6	-1.4	-2.6

Use an established model:

	GSM01 -----	Bricaud -----
adg	-9.0	-14.4
aph	-24.5	-12.8
bbp	-30.4	-20.2